

STS 123 Return Samples: Assessment of Air Quality aboard the Shuttle (STS-123) and International Space Station (1J/A)

The toxicological assessment of 1 grab sample canister (GSC) from the Shuttle is reported in Table 1. The end-of-mission sample was not properly acquired. Analytical methods have not changed from earlier reports. The recoveries of the 3 surrogates (^{13}C -acetone, fluorobenzene, and chlorobenzene) from the GSC were 113, 110, and 102%. The Shuttle atmosphere was acceptable for human respiration based on historical data from earlier missions.

Table 1. Analytical Summary of Shuttle Samples

Sample Location	Date of Sample	NMVOCs ^a (mg/m ³)	T Value ^b (units)	Alcohols (mg/m ³)	Formaldehyde ($\mu\text{g}/\text{m}^3$)
Flight deck (preflight)	3/10/08	0.3	0.03	0.1	--

^a Non-methane volatile organic hydrocarbons.

^b Calculated excluding CO₂, formaldehyde, and siloxanes.

The toxicological assessment of 3 GSCs from the ISS is shown in Table 2. Formaldehyde badges were not returned. The recoveries from the 3 standards (as listed above) from the GSCs averaged 97, 91 and 92%, respectively. Episodically during the mission the crew reported symptoms consistent with excess exposure to carbon dioxide. During one event, near MET 1.1, the CO₂ concentration reached 7.2 mmHg (eclssmer data).

Table 2. Analytical Summary of ISS Results (previously reported values are in gray)

Module/Sample	Approx. Date	NMVOCs ^a (mg/m ³)	T Value ^b (units)	Alcohols (mg/m ³)	Formaldehyde ($\mu\text{g}/\text{m}^3$)
Lab	2/25/08	5	0.16	4.4	--
Columbus	2/25/08	6	0.19	4.5	--
JLP [first entry]	3/14/08	18	0.80	7.9	--
<i>Guideline</i>		<25	<1.0	<5	<120

^a Non-methane volatile organic hydrocarbons.

^b Calculated excluding CO₂, formaldehyde, and siloxanes.

A third sample taken on 2/25/08 in the Service Module was invalid due to a leak in the canister. The first-entry sample is typical of new modules that have been sealed for some time.

Trimethylsilanol, a common product of materials offgassing, was the major component found when the crew entered the JLP module on orbit. The nominal air quality continues to be acceptable for respiration based on limited samples.

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Enclosures

Table 1A: [Analytical concentrations of compounds found in the STS-123 GSCs](#)

Table 1B: [Analytical concentrations of compounds found in 1J/A GSCs](#)

Table 2A: [T-values of the compounds in table 1A](#)

Table 2B: [T-values of the compounds in table 1B](#)

TABLE 1A
ANALYTICAL RESULTS OF
STS-123 RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	AA04501 Preflight SN 1083 03/10/08 @ 07:05 EST
TARGET COMPOUNDS (TO-14/POLAR)***	
FREON12	<0.025
CHLOROMETHANE	<0.025
FREON114	<0.025
METHANOL	TRACE
ACETALDEHYDE	0.096
VINYLCHLORIDE	<0.025
BROMOMETHANE	<0.025
ETHANOL	TRACE
CHLOROETHANE	<0.025
ACETONITRILE	TRACE
PROPENAL	<0.025
ACETONE	0.061
PROPANAL	0.033
ISOPROPANOL	TRACE
FREON11	<0.025
FURAN	<0.025
ACRYLONITRILE	<0.025
PENTANE	<0.025
2-METHYL-2-PROPANOL	<0.025
METHYLACETATE	<0.025
1,1-DICHLOROETHENE	<0.025
DICHLOROMETHANE	<0.025
3-CHLOROPROPENE	<0.025
FREON113	<0.025
N-PROPANOL	<0.025
1,1-DICHLOROETHANE	<0.025
BUTANAL	TRACE
2-BUTANONE	TRACE
CIS-1,2-DICHLOROETHENE	<0.025
2-METHYLFURAN	<0.025
ETHYLACETATE	<0.025
HEXANE	<0.025
CHLOROFORM	<0.025
2-BUTENAL	<0.025
1,2-DICHLOROETHANE	<0.025
1,1,1-TRICHLOROETHANE	<0.025
N-BUTANOL	<0.025
BENZENE	<0.025
CARBONTETRACHLORIDE	<0.025
2-PENTANONE	TRACE
2-METHYLHEXANE	<0.025
2,3-DIMETHYLPENTANE	<0.025

PENTANAL	TRACE
3-METHYLHEXANE	<0.025
1,2-DICHLOROPROPANE	<0.025
1,4-DIOXANE	<0.025
TRICHLOROETHENE	<0.025
2,5-DIMETHYLFURAN	<0.025
N-HEPTANE	<0.025
4-METHYL2-PENTANONE	<0.025
CIS-1,3-DICHLOROPROPENE	<0.025
2-PENTENAL	<0.025
TRANS-1,3-DICHLOROPROPENE	<0.025
1,1,2-TRICHLOROETHANE	<0.025
TOLUENE	<0.025
HEXANAL	TRACE
MESITYLOXIDE	<0.025
1,2-DIBROMOETHANE	<0.025
BUTYLACETATE	<0.025
OCTANE	<0.025
TETRACHLOROETHENE	<0.025
CHLOROBENZENE	<0.025
ETHYLBENZENE	<0.025
M/P-XYLENES	<0.025
2-HEPTANONE	<0.025
CYCLOHEXANONE	<0.025
HEPTANAL	TRACE
STYRENE	<0.025
1,1,2,2-TETRACHLOROETHANE	<0.025
O-XYLENE	<0.025
NONANE	<0.025
1,3,5-TRIMETHYLBENZENE	<0.025
1,2,4-TRIMETHYLBENZENE	<0.025
DECANE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
1,2-DICHLOROBENZENE	<0.025
1,2,4-TRICHLOROBENZENE	<0.025
HEXAChLORO-1,3-BUTADIENE	<0.025

TARGET COMPOUNDS (TOXIC)	
1,3-BUTADIENE	<0.025
ETHYLENE OXIDE	<0.025
CARBON DISULFIDE	<0.025
2-METHYL-2-PROPENAL	<0.025
3-BUTEN-2-ONE	<0.025
2-ETHOXYETHANOL	<0.025
DIMETHYLDISULFIDE	<0.025
OCTAMETHYLCYCLOTETRASILOXANE	*

NON-TARGET COMPOUNDS	
HEXAMETHYLCYCLOTRISILOXANE	*

TOTAL ALCOHOLS PLUS ACETONE	0.098
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TARGET COMPOUNDS (GC)***	
CARBON MONOXIDE	<0.29
METHANE	<1.6
HYDROGEN	<0.41
CARBON DIOXIDE	TRACE

TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS)	0.32
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***Present, subject to large, random variability, therefore not quantifiable**

< : Value is less than the laboratory report detection limit.

TRACE: Amount detected is sufficient for compound identification only.

*** Measurements are calibrated by multi-point initial calibration and verified by mid-point continuing calibration.

TABLE 1B
ANALYTICAL RESULTS OF
1J/A RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	CONCENTRATION (mg/m ³)		
	AA04506 S/N 1007 LAB 02/25/08 @ 12:10 GMT	AA04507 S/N 1072 Columbus 02/25/08 @ 12:12 GMT	AA04509 S/N 1056 JLP 03/14/08 @ 20:07 GMT
TARGET COMPOUNDS (TO-14/POLAR)***			
FREON12	TRACE	TRACE	TRACE
CHLOROMETHANE	TRACE	TRACE	TRACE
FREON114	<0.025	<0.025	<0.063
METHANOL **	0.25	0.51	1.0
ACETALDEHYDE	0.081	0.10	0.12
VINYLCHLORIDE	<0.025	<0.025	<0.063
BROMOMETHANE	<0.025	<0.025	<0.063
ETHANOL *	3.6	3.6	3.0
CHLOROETHANE	<0.025	<0.025	TRACE
ACETONITRILE	TRACE	TRACE	TRACE
PROPENAL	<0.025	<0.025	<0.063
ACETONE	0.19	0.19	0.32
PROPANAL	TRACE	TRACE	TRACE
ISOPROPANOL *	0.13	0.15	3.3
FREON11	<0.025	<0.025	<0.063
FURAN	<0.025	<0.025	<0.063
ACRYLONITRILE	TRACE	TRACE	<0.063
PENTANE	<0.025	<0.025	TRACE
2-METHYL-2-PROPANOL	TRACE	TRACE	TRACE
METHYLACETATE	TRACE	TRACE	TRACE
1,1-DICHLOROETHENE	<0.025	<0.025	TRACE
DICHLOROMETHANE	0.026	0.034	TRACE
3-CHLOROPROPENE	<0.025	<0.025	<0.063
FREON113	<0.025	<0.025	<0.063
N-PROPANOL	0.10	0.030	TRACE
1,1-DICHLOROETHANE	<0.025	<0.025	<0.063
BUTANAL	TRACE	TRACE	TRACE
2-BUTANONE	TRACE	TRACE	0.14
CIS-1,2-DICHLOROETHENE	<0.025	<0.025	<0.063
2-METHYLFURAN	<0.025	<0.025	<0.063
ETHYLACETATE	0.032	0.031	TRACE
HEXANE	<0.025	<0.025	<0.063
CHLOROFORM	<0.025	<0.025	<0.063
2-BUTENAL	<0.025	<0.025	<0.063
1,2-DICHLOROETHANE	TRACE	TRACE	<0.063
1,1,1-TRICHLOROETHANE	<0.025	<0.025	<0.063

N-BUTANOL	0.062	0.078	0.14
BENZENE	<0.025	<0.025	TRACE
CARBONTETRACHLORIDE	<0.025	<0.025	<0.063
2-PENTANONE	<0.025	<0.025	<0.063
2-METHYLHEXANE	TRACE	TRACE	<0.063
2,3-DIMETHYLPENTANE	TRACE	TRACE	<0.063
PENTANAL	<0.025	<0.025	<0.063
3-METHYLHEXANE	TRACE	TRACE	<0.063
1,2-DICHLOROPROPANE	<0.025	<0.025	<0.063
1,4-DIOXANE	<0.025	<0.025	<0.063
TRICHLOROETHENE	<0.025	<0.025	<0.063
2,5-DIMETHYLFURAN	<0.025	<0.025	<0.063
N-HEPTANE	<0.025	<0.025	<0.063
4-METHYL2-PENTANONE	<0.025	<0.025	TRACE
CIS-1,3-DICHLOROPROPENE	<0.025	<0.025	<0.063
2-PENTENAL	<0.025	<0.025	<0.063
TRANS-1,3-DICHLOROPROPENE	<0.025	<0.025	<0.063
1,1,2-TRICHLOROETHANE	<0.025	<0.025	<0.063
TOLUENE	0.028	0.028	TRACE
HEXANAL	TRACE	<0.025	<0.063
MESITYLOXIDE	<0.025	<0.025	<0.063
1,2-DIBROMOETHANE	<0.025	<0.025	<0.063
BUTYLACETATE	TRACE	TRACE	<0.063
OCTANE	<0.025	<0.025	<0.063
TETRACHLOROETHENE	<0.025	<0.025	<0.063
CHLOROBENZENE	<0.025	<0.025	<0.063
ETHYLBENZENE	<0.025	<0.025	TRACE
M/P-XYLENES	TRACE	TRACE	TRACE
2-HEPTANONE	<0.025	<0.025	<0.063
CYCLOHEXANONE	0.044	0.049	TRACE
HEPTANAL	<0.025	<0.025	TRACE
STYRENE	<0.025	<0.025	<0.063
1,1,2,2-TETRACHLOROETHANE	<0.025	<0.025	<0.063
O-XYLENE	0.059	0.056	TRACE
NONANE	<0.025	<0.025	<0.063
1,3,5-TRIMETHYLBENZENE	<0.025	<0.025	<0.063
1,2,4-TRIMETHYLBENZENE	<0.025	<0.025	<0.063
DECANE	<0.025	<0.025	<0.063
1,3-DICHLOROBENZENE	<0.025	<0.025	<0.063
1,4-DICHLOROBENZENE	<0.025	<0.025	<0.063
1,2-DICHLOROBENZENE	<0.025	<0.025	<0.063
1,2,4-TRICHLOROBENZENE	<0.025	<0.025	<0.063
HEXACHLORO-1,3-BUTADIENE	<0.025	<0.025	<0.063

TARGET COMPOUNDS (TOXIC)			
1,3-BUTADIENE	<0.025	<0.025	<0.063
ETHYLENE OXIDE	<0.025	<0.025	<0.063
CARBON DISULFIDE	TRACE	TRACE	<0.063
2-METHYL-2-PROPENAL	<0.025	<0.025	<0.063

3-BUTEN-2-ONE	<0.025	<0.025	<0.063
2-ETHOXYETHANOL	<0.025	<0.025	<0.063
DIMETHYLDISULFIDE	<0.025	<0.025	<0.063
OCTAMETHYLCYCLOTETRASILOXANE	##	##	##

NON-TARGET COMPOUNDS			
SULFURHEXAFLUORIDE	0.026	0.038	TRACE
OCTAFLUOROPROPANE	#	#	#
BROMOTRIFLUOROMETHANE	0.044	0.058	0.075
FLUOROTRIMETHYLSILANE	TRACE	TRACE	0.15
2-METHYL-1,3-BUTADIENE	0.034	0.044	TRACE
TRIMETHYLSILANOL	0.16	0.20	7.9
1,3-DIOXOLANE	0.10	0.097	TRACE
HEXAMETHYLDISILOXANE	<0.025	<0.025	0.28
PENTAMETHYLDISILOXANE-1-OL	<0.025	<0.025	0.22
HEXAMETHYLCYCLOTRISILOXANE	##	##	##
2-ETHYL-1-HEXANOL	0.043	0.059	0.081
LIMONENE	0.060	0.057	TRACE
DECAMETHYLCYCLOPENTASILOXANE	##	##	##

TOTAL ALCOHOLS PLUS ACETONE	4.4	4.5	7.9
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TARGET COMPOUNDS (GC)***			
CARBON MONOXIDE	TRACE	TRACE	TRACE
METHANE	10	10	TRACE
HYDROGEN	1.9	1.8	<.041
CARBON DIOXIDE	6300	6100	4500

TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS)	5.4	5.6	18
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* FROM GC/FID RESULTS

**FROM GC/FID RESULTS; MeOH Conc.=GC MeOH Conc.-(2^* GC/MS ACETALDEHYDE Conc.)

Present, but not quantitated

Present, subject to large, random variability, therefore not quantifiable

< : Value is less than the laboratory report detection limit.

TRACE: Amount detected is sufficient for compound identification only.

*** Measurements are calibrated by multi-point initial calibration and verified by mid-point continuing calibration.

TABLE 2A
ANALYTICAL RESULTS OF
STS-123 RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	AA04501
	Preflight SN 1083 03/10/08 @ 07:05 EST T-Value (180-d SMAC)
TARGET COMPOUNDS (TO-14/POLAR)	
FREON12	ND
CHLOROMETHANE	ND
FREON114	ND
METHANOL	0.00139
ACETALDEHYDE	0.02411
VINYLCHLORIDE	ND
BROMOMETHANE	ND
ETHANOL	0.00001
CHLOROETHANE	ND
ACETONITRILE	0.00187
PROPENAL	ND
ACETONE	0.00117
PROPANAL	0.00232
ISOPROPANOL	0.00008
FREON11	ND
FURAN	ND
ACRYLONITRILE	ND
PENTANE	ND
2-METHYL-2-PROPANOL	ND
METHYLACETATE	ND
1,1-DICHLOROETHENE	ND
DICHLOROMETHANE	ND
3-CHLOROPROPENE	ND
FREON113	ND
N-PROPANOL	ND
1,1-DICHLOROETHANE	ND
BUTANAL	0.00071
2-BUTANONE	0.00042
CIS-1,2-DICHLOROETHENE	ND
2-METHYLFURAN	ND
ETHYLACETATE	ND
HEXANE	ND
CHLOROFORM	ND
2-BUTENAL	ND
1,2-DICHLOROETHANE	ND
1,1,1-TRICHLOROETHANE	ND
N-BUTANOL	ND
BENZENE	ND
CARBONTETRACHLORIDE	ND
2-PENTANONE	0.00018
2-METHYLHEXANE	ND
2,3-DIMETHYLPENTANE	ND

PENTANAL	0.00059
3-METHYLHEXANE	ND
1,2-DICHLOROPROPANE	ND
1,4-DIOXANE	ND
TRICHLOROETHENE	ND
2,5-DIMETHYLFURAN	ND
N-HEPTANE	ND
4-METHYL2-PENTANONE	ND
CIS-1,3-DICHLOROPROPENE	ND
2-PENTENAL	ND
TRANS-1,3-DICHLOROPROPENE	ND
1,1,2-TRICHLOROETHANE	ND
TOLUENE	ND
HEXANAL	0.00051
MESITYLOXIDE	ND
1,2-DIBROMOETHANE	ND
BUTYLACETATE	ND
OCTANE	ND
TETRACHLOROETHENE	ND
CHLOROBENZENE	ND
ETHYLBENZENE	ND
M/P-XYLENES	ND
2-HEPTANONE	ND
CYCLOHEXANONE	ND
HEPTANAL	0.00045
STYRENE	ND
1,1,2,2-TETRACHLOROETHANE	ND
O-XYLENE	ND
NONANE	ND
1,3,5-TRIMETHYLBENZENE	ND
1,2,4-TRIMETHYLBENZENE	ND
DECANE	ND
1,3-DICHLOROBENZENE	ND
1,4-DICHLOROBENZENE	ND
1,2-DICHLOROBENZENE	ND
1,2,4-TRICHLOROBENZENE	ND
HEXAChLORO-1,3-BUTADIENE	ND

TARGET COMPOUNDS (TOXIC)	
1,3-BUTADIENE	ND
ETHYLENE OXIDE	ND
CARBON DISULFIDE	ND
2-METHYL-2-PROPENAL	ND
3-BUTEN-2-ONE	ND
2-ETHOXYETHANOL	ND
DIMETHYLDISULFIDE	ND
OCTAMETHYLCYCLOTETRASILOXANE	*

NON-TARGET COMPOUNDS	
HEXAMETHYLCYCLOTRISILOXANE	*

TARGET COMPOUNDS (GC)

CARBON MONOXIDE	0.00000
METHANE	0.00000
HYDROGEN	0.00000
CARBON DIOXIDE	0.01538

TOTAL T-VALUE	0.04918
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*Present, but not included in total T-Value

ND : Value is less than the laboratory report detection limit.

Note: Number of decimal places in T-Values do not represent significant figures of measurements.

TABLE 2B
ANALYTICAL RESULTS OF
1J/A RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	T-VALUE (180-d SMAC)		
	AA04506 S/N 1007 LAB 02/25/08 @ 12:10 GMT	AA04507 S/N 1072 Columbus 02/25/08 @ 12:12 GMT	AA04509 S/N 1056 JLP 03/14/08 @ 20:07 GMT
TARGET COMPOUNDS (TO-14/POLAR)			
FREON12	0.00003	0.00003	0.00003
CHLOROMETHANE	0.00030	0.00030	0.00030
FREON114	ND	ND	ND
<i>METHANOL</i> **	0.02813	0.05648	0.11441
ACETALDEHYDE	0.02035	0.02560	0.03049
VINYLCHLORIDE	ND	ND	ND
BROMOMETHANE	ND	ND	ND
<i>ETHANOL</i> *	0.00182	0.00178	0.00152
CHLOROETHANE	ND	ND	0.00005
ACETONITRILE	0.00187	0.00187	0.00187
PROPENAL	ND	ND	ND
ACETONE	0.00373	0.00358	0.00621
PROPANAL	0.00347	0.00347	0.00347
<i>ISOPROPANOL</i> *	0.00088	0.00103	0.02213
FREON11	ND	ND	ND
FURAN	ND	ND	ND
ACRYLONITRILE	0.00446	0.00446	ND
PENTANE	ND	ND	0.00002
2-METHYL-2-PROPANOL	0.00010	0.00010	0.00010
METHYLACETATE	0.00010	0.00010	0.00010
1,1-DICHLOROETHENE	ND	ND	0.00158
DICHLOROMETHANE	0.00258	0.00340	0.00125
3-CHLOROPROPENE	ND	ND	ND
FREON113	ND	ND	ND
N-PROPANOL	0.00106	0.00030	0.00013
1,1-DICHLOROETHANE	ND	ND	ND
BUTANAL	0.00284	0.00284	0.00284
2-BUTANONE	0.00042	0.00042	0.00469
CIS-1,2-DICHLOROETHENE	ND	ND	ND
2-METHYLFURAN	ND	ND	ND
ETHYLACETATE	0.00018	0.00017	0.00007
HEXANE	ND	ND	ND
CHLOROFORM	ND	ND	ND
2-BUTENAL	ND	ND	ND
1,2-DICHLOROETHANE	0.01250	0.01250	ND
1,1,1-TRICHLOROETHANE	ND	ND	ND

N-BUTANOL	0.00156	0.00196	0.00349
BENZENE	ND	ND	0.06250
CARBONTETRACHLORIDE	ND	ND	ND
2-PENTANONE	ND	ND	ND
2-METHYLHEXANE	0.00043	0.00043	ND
2,3-DIMETHYLPENTANE	0.00006	0.00006	ND
PENTANAL	ND	ND	ND
3-METHYLHEXANE	0.00043	0.00043	ND
1,2-DICHLOROPROPANE	ND	ND	ND
1,4-DIOXANE	ND	ND	ND
TRICHLOROETHENE	ND	ND	ND
2,5-DIMETHYLFURAN	ND	ND	ND
N-HEPTANE	ND	ND	ND
4-METHYL2-PENTANONE	ND	ND	0.00009
CIS-1,3-DICHLOROPROPENE	ND	ND	ND
2-PENTENAL	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE	ND	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND	ND
TOLUENE	0.00047	0.00047	0.00021
HEXANAL	0.00205	ND	ND
MESITYLOXIDE	ND	ND	ND
1,2-DIBROMOETHANE	ND	ND	ND
BUTYLACETATE	0.00007	0.00007	ND
OCTANE	ND	ND	ND
TETRACHLOROETHENE	ND	ND	ND
CHLOROBENZENE	ND	ND	ND
ETHYLBENZENE	ND	ND	0.00025
M/P-XYLENES	0.00006	0.00006	0.00006
2-HEPTANONE	ND	ND	ND
CYCLOHEXANONE	0.00073	0.00082	0.00021
HEPTANAL	ND	ND	0.00179
STYRENE	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	ND	ND	ND
O-XYLENE	0.00027	0.00026	0.00006
NONANE	ND	ND	ND
1,3,5-TRIMETHYLBENZENE	ND	ND	ND
1,2,4-TRIMETHYLBENZENE	ND	ND	ND
DECANE	ND	ND	ND
1,3-DICHLOROBENZENE	ND	ND	ND
1,4-DICHLOROBENZENE	ND	ND	ND
1,2-DICHLOROBENZENE	ND	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND	ND
HEXACHLORO-1,3-BUTADIENE	ND	ND	ND

TARGET COMPOUNDS (TOXIC)			
1,3-BUTADIENE	ND	ND	ND
ETHYLENE OXIDE	ND	ND	ND
CARBON DISULFIDE	0.00078	0.00078	ND
2-METHYL-2-PROPENAL	ND	ND	ND

3-BUTEN-2-ONE	ND	ND	ND
2-ETHOXYETHANOL	ND	ND	ND
DIMETHYLDISULFIDE	ND	ND	ND
OCTAMETHYLCYCLOTETRASILOXANE	##	##	##

NON-TARGET COMPOUNDS			
SULFURHEXAFLUORIDE	0.00002	0.00003	0.00001
OCTAFLUOROPROPANE	#	#	#
BROMOTRIFLUOROMETHANE	0.00000	0.00001	0.00001
FLUOROTRIMETHYLSILANE	0.02500	0.02500	0.29476
2-METHYL-1,3-BUTADIENE	0.01145	0.01476	0.00417
TRIMETHYLSILANOL	0.00434	0.00527	0.21440
1,3-DIOXOLANE	0.00291	0.00270	0.00035
HEXAMETHYLDISILOXANE	ND	ND	0.00284
PENTAMETHYLDISILOXANE-1-OL	ND	ND	0.00446
HEXAMETHYLCYCLOTRISILOXANE	##	##	##
2-ETHYL-1-HEXANOL	0.00081	0.00110	0.00153
LIMONENE	0.00011	0.00010	0.00002
DECAMETHYLCYCLOPENTASILOXANE	##	##	##

TARGET COMPOUNDS (GC)			
CARBON MONOXIDE	0.01302	0.01302	0.01302
METHANE	0.00270	0.00274	0.00022
HYDROGEN	0.00552	0.00538	0.00000
CARBON DIOXIDE	0.48554	0.46978	0.34958

TOTAL T-VALUE	0.64314	0.66367	1.14530
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* FROM GC/FID RESULTS

**FROM GC/FID RESULTS; MeOH Conc.=GC MeOH Conc.- (2* GC/MS ACETALDEHYDE Conc.)

Present, but not calculated

Present, subject to large, random variability, therefore not quantifiable

ND : Value is less than the laboratory report detection limit.

Note: Number of decimal places in T-Values do not represent significant figures of measurements.